



Scaling interactive applications for clinical & RWE insights

Best practices for adoption, compliance,
and long-term impact

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The insight delivery gap

RWE and clinical teams face exploding data sources, rising regulatory demands, and growing payer expectations



What's broken today

- Static outputs; stakeholders wait weeks for re-analysis
- Fragmented tools across teams and studies
- Compliance risk from manual, undocumented workflows
- No chain of custody from data to decision



What great looks like

- Interactive apps for real-time exploration
- Unified environment across RWE, clinical
- Reusable, governed, trusted workflows
- Full traceability from raw data to insight

The cost of the status quo

Every manual re-analysis cycle carries hidden costs in time, compliance risk, and decision delays



Manual re-analysis

- 2-4 weeks per subgroup request
- Time consumed by repeat runs
- Manual QC for every new output
- Decisions delayed until next reporting cycle



App-driven analysis

- Seconds to apply a new filter or subgroup
- Programmers freed for high-value work
- QC built in; validated once, always trusted
- Real-time insights speed decision-making

When do apps add value over static outputs?

A decision framework helps teams invest effort where it drives the most impact



Repeated Questions

Stakeholders repeatedly ask for the same analysis with different parameters (subgroups, time periods, endpoints)



Multiple Audiences

Clinical, medical affairs, regulatory, and commercial teams all need the same data from different angles



Evolving Data

Data accumulates over time (interim analyses, ongoing RWE studies, or post-market surveillance)

If the answer is "run it again with different filters," that's your signal to build an app

Designing apps that drive adoption



Start with the decision

Design around the decision stakeholders need to make, not the data you have. What action will this enable?



Progressive disclosure

Show the essential view first. Let power users drill deeper. Don't overwhelm with every parameter upfront.



Know your personas

A medical director, a biostatistician, and a regulatory reviewer need different views of the same data.



Consistency & standards

Reusable templates, shared design systems, and consistent navigation reduce the learning curve for every new app.

The platform shift

From models for insights → Applications for decisions

1

Build the model

Data scientists develop and validate analytical models in a governed, reproducible environment

2

Publish as an app

Turn validated models into interactive applications without a separate engineering team

3

Stakeholders act

Clinical, regulatory, and commercial teams explore results and make faster, data-driven decisions

Apps: The last mile of AI

Apps bridge the gap between model development and stakeholder decisions



One platform, full lifecycle

Develop, validate, publish, and manage apps in one unified environment; deploy as interactive apps, APIs, or models



Chain of custody built in

Full traceability from raw data → code → output; SCE QC workflows and role-based access ensure audit readiness



Flexible frameworks

Build with Shiny, Dash, Streamlit, Flask, or custom frameworks; Domino supports the tools your team already knows



Reusable science at scale

Standardize workflows once, reuse across studies; auto-scaling infrastructure ensures apps perform under load

Use cases across clinical & RWE



Clinical Trial Reporting

Interactive TLFs, patient-level explorers, and safety signal dashboards

Stakeholders filter by subgroup, endpoint, and visit without waiting for re-runs



RWE Insights Dashboards

Real-time cohort selection across claims and EMR data

Explore adherence, treatment patterns, and outcomes with model-integrated analytics



Regulatory Submissions

Governed, reproducible outputs with full chain of custody from data source to final deliverable

Ready for health authority inspection

What does an interactive app look like?

What stakeholders actually experience



Parameterized Inputs

Dropdowns for subgroups, endpoints, time periods, and visit windows let stakeholders self-serve without re-running code



Dynamic Visualizations

Charts, tables, and patient-level explorers update in real time. Forest plots, KM curves, and waterfall plots respond to filters instantly



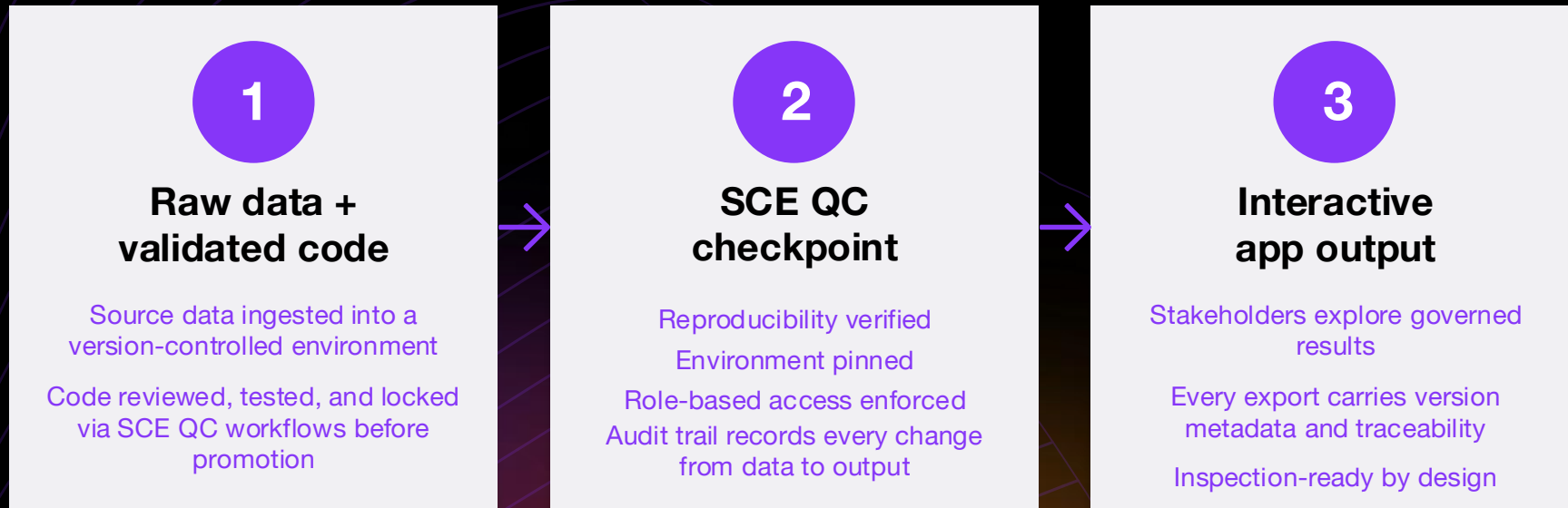
Governed Outputs

Every view is traceable. Exports carry metadata, version stamps, and audit trails for regulatory confidence

Think of it as a governed, reproducible TLF that stakeholders can tune themselves

Anatomy of a governed app

Full chain of custody from raw data to stakeholder insight with SCE QC at every stage



Balancing innovation with compliance

Self-service interactivity and regulatory rigor are not opposites



Enabling innovation

- Flexible framework support (Shiny, Dash, Streamlit, custom)
- Self-service exploration with parameterized views
- Rapid prototyping with pre-built templates
- Model-powered insights surfaced in apps



Ensuring compliance

- Audit-ready traceability (SCE QC workflows)
- Role-based access control and governance
- Version-controlled, reproducible environments
- Full chain of custody:
Raw data → code → output

Scaling apps sustainably

01



Identify high-value use cases

Focus on analyses with repeated questions, multiple audiences, or evolving data

02



Standardize with templates

Create reusable app templates with consistent UX and pre-approved components

03



Build internal capability

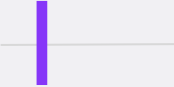
Train data scientists to publish apps to reduce dependency on engineering

04



Govern and iterate

Establish app lifecycle policies: versioning, retirement, and ongoing QC



Adoption challenges and lessons learned

SAS-trained resistance

Teams comfortable with SAS may resist.
Start with familiar outputs (TLFs) delivered through apps, not a full language migration.

IT security pushback

Self-service apps raise access concerns.
Work with IT early to define role-based access and network isolation requirements.

Overengineering version 1

The biggest risk is building too much too soon. Ship a focused prototype in two weeks, not a perfect app in six months.

Governance gaps

Reusable templates, shared design systems, and consistent navigation reduce the learning curve for every new app.

Your first 30 days: A practical roadmap

Week 1



Pick one analyses

Find one analysis your team reruns frequently
Safety signal review and subgroup exploration are great candidates

Week 2



Build a prototype

Use Shiny, Dash, Streamlit to wrap existing validated code
Focus on three key filters stakeholders need most

Week 3



Demo to stakeholders

Show it to three stakeholders from different functions
Capture feedback on what's missing vs. what's noise

Week 4



Propose a plan to scale

Present the prototype with a governance plan
Versioning, access controls, and a template for the next three apps

Key takeaways

- ✓ Apps add value when stakeholders need to explore, not just consume, results.
Use a decision framework to pick the right use cases.
- ✓ Design for the decision, not the data.
Progressive disclosure and persona-aware UX drive adoption across diverse stakeholders.
- ✓ Innovation and compliance are complementary.
The right platform embeds governance into the app lifecycle, not around it.
- ✓ Scaling sustainably means standardizing templates, building internal capability, and establishing clear lifecycle governance.



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Thank you.